REMARKS

By virtue of the present amendment, claims 68-88 have been added to the above-identified application. These claims, as will be discussed in greater detail below, correspond either exactly or in modified form to claims 1-5 and 10-14.

The '163 patent whose claims have been copied by this amendment has, on its face, a filing date of March 5, 1999. The present application has an effective filing date of June 1, 1998. Therefore, quite clearly, applicants are prima facie the first inventors of the common subject matter.

In copying the claims of the '163 patent, applicants believe that claim 12 is the broadest of the claims in the '163 patent, and that claim has been copied verbatim as claim 70 in the present amendment. Claim 10, as the Examiner will note, has been copied verbatim and presented in this application as claim 68. Set forth hereinafter is a comparison between the words of claims 68 to 72 with the present specification, demonstrating that the present specification supports claims 68-72 verbatim, with one exception. Claim 13 of the '163 patent defines the cleaning chamber as a "spin-rinse-dry chamber". As the Examiner is aware, that is a conventional piece of equipment in the semiconductor processing field. The present specification points out that one of the processing stations can be a rinse-dry processing station, but makes no reference to the conventional step of spinning. In light of that fact, applicants have, in copying claim 13, used a modified claim in which the term "spin" has been omitted as an immaterial limitation in the claim.

68. An electro-chemical deposition system, comprising:	Figure 1; p. 6, lines 2-4, "Fig. 1 shows various components of a processing station 10 suitable for electroplating a metal, such as copper, onto a semiconductor wafer in accordance with the disclosed method."; Figures 16 and 17; p. 27, lines 18-20, "One or more of the foregoing heating systems may be integrated with a wet-chemical processing tool that is capable of electrochemical deposition of copper."
a) a wafer transfer apparatus;	Figures 16 and 17; p. 28, lines 7-9, "The workpieces are transferred between the processing stations 610 and the annealing station 615 using one or more robotic arms 620 that are disposed for linear movement along a central track 625."; p. 28, lines 11-13, "Unlike the embodiment of Fig. 16, this embodiment employs a separate heating unit 635 that is serviced by a dedicated robotic mechanism 640."
b) a loading station disposed in connection with the wafer transfer apparatus;	Figures 16 and 17 (reference "I/O")
c) one or more processing cells disposed in connection with the wafer transfer apparatus;	Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more electroplating stations, although further wet-chemical processing stations may also be employed."
d) an electrolyte supply fluidly connected to the one or more processing cells;	Figure 1; p. 7, lines 10-12, "Process fluid is provided to the cup through fluid inlet line 65 and proceeds therefrom through fluid inlet openings 75. Plating fluid then fills the chamber 35 through openings 75 as supplied by a plating fluid pump (not shown) or other suitable supply."

e) a wafer cleaner station disposed in connection with the wafer transfer apparatus; and	Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more electroplating stations, although further wet-chemical processing stations may also be employed."
f) a thermal anneal chamber disposed in connection with the wafer transfer apparatus.	Figure 16; p. 28, lines 4 -9, "The system also preferably includes an annealing station, such as at 615, for executing a low-temperature annealing process on each workpiece. The annealing process may be executed in a single-wafer or batch processing fashion. The workpieces are transferred between the processing stations 610 and the annealing station 615 using one or more robotic arms 620 that are disposed for linear movement along a central track 625."; Figure 17; p. 28, lines 10-14, "Fig. 17 illustrates a further manner in which an annealing station 630 may be integrated in a wet-chemical processing tool set. Unlike the embodiment of Fig. 16, this embodiment employs a separate heating unit 635 that is serviced by a dedicated robotic mechanism 640. The dedicated robotic mechanism 640 accepts workpieces that are transferred to it by the robotic mechanisms 620."

69. The system of claim 68, wherein the wafer cleaner is a rinse-dry chamber.	Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more electroplating stations, although further wet-chemical processing stations may also be employed."

70. A system for depositing a layer on a substrate, comprising:	Figure 1; p. 6, lines 2-4, "Fig. 1 shows various components of a processing station 10 suitable for electroplating a metal, such as copper, onto a semiconductor wafer in accordance with the disclosed method."; Figures 16 and 17; p. 27, lines 18-20, "One or more of the foregoing heating systems may be integrated with a wet-chemical processing tool that is capable of electrochemical deposition of copper."
at least one electrolyte processing cell station;	Figure 1; p. 6, lines 2-4, "Fig. 1 shows various components of a processing station 10 suitable for electroplating a metal, such as copper, onto a semiconductor wafer in accordance with the disclosed method."; Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more electroplating stations, although further wet-chemical processing stations may also be employed."
at least one annealing chamber;	Figure 16; p. 28, lines 4 -9, "The system also preferably includes an annealing station, such as a at 615, for executing a low-temperature annealing process on each workpiece. The annealing process may be executed and a single-the paper or batch processing fashion. The workpieces are transferred between the processing stations 610 and the annealing station 615 using

	one or more robotic arms 620 that are disposed for linear movement along a central tract 625."; Figure 17; p. 28, lines 10-14, "Fig. 17 illustrates a further manner in which an annealing station 630 may be integrated in a wet-chemical processing tool set. Unlike the embodiment of Fig. 16, this embodiment employs a separate heating unit 635 that is serviced by a dedicated robotic mechanism 640. The dedicated robotic mechanism 640 accepts workpieces that are transferred to it by the robotic mechanisms 620."
at least one substrate cleaner; and	Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more electroplating stations, although further wet-chemical processing stations may also be employed."
a substrate transfer apparatus adapted to access the electrolyte processing cell, the annealing chamber, and the substrate cleaner.	Figures 16 and 17; p. 28, lines 7-9, "The workpieces are transferred between the processing stations 610 and the annealing station 615 using one or more robotic arms 620 that are disposed for linear movement along a central track 625."; p. 28, lines 11-13, "Unlike the embodiment of Fig. 16, this embodiment employs a separate heating unit 635 that is serviced by a dedicated robotic mechanism 640."

71. The system of claim 70, wherein the substrate cleaner is a rinse-dry chamber.	Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more electroplating stations, although further wet-chemical processing stations may also be employed."

72. The system of claim 70, wherein the substrate transfer apparatus comprises a first robot positioned to access the substrate cleaner and the electrolyte processing cell, and a second robot positioned to access the substrate cleaner and the annealing chamber.	Figures 16 and 17; p. 28, lines 7-9, "The workpieces are transferred between the processing stations 610 and the annealing station 615 using one or more robotic arms 620 that are disposed for linear movement along a central track 625."; p. 28, lines 11-13, "Unlike the embodiment of Fig. 16, this embodiment employs a separate heating unit 635 that is serviced by a dedicated robotic mechanism 640."

Applicants have also copied claims 1-5 from the '163 patent in modified form as claims 73-77. Once again, the present application does not refer to the conventional apparatus of a spin-rinse-dry chamber, or SRD, as called for in clause (e) of claim 1 of the '163 patent. Instead, the present application, as previously pointed out, refers to a rinse-dry chamber. Accordingly, claim 73 has been written in modified form to omit reference to the conventional step of spinning in a rinser-dryer. As the Examiner will note in connection with the prosecution history of the '163 patent, the fact that the chamber was defined as a spin-rinse-dry chamber was not material to patentability, and hence claim 73, in using the term "rinse-dry chamber," is substantially the same as spin-rinse-dry chamber appearing in claim 1 of the '163 patent.

Similarly, in claim 73, clause (e), applicants have modified the language "disposed between the loading station and the mainframe" of claim 1, clause (e) to read "disposed for access to its loading station." The present specification teaches that any one of the processing stations 610 can be any of a variety of processing stations and

therefore the present specification describes an infinite number of combinations. However, to avoid any debate over that issue, applicants have modified claim 73 to delete the reference to the mainframe and define the location of the rinse-dry chamber in terms of its essential function. It is for that reason that claim 73 refers to the rinse-dry chamber as positioned or disposed for access to the loading station – capturing the essence of the combination.

Claim 1 refers to the thermal anneal chamber as "disposed adjacent" the loading station. To avoid any debate as to whether the present application supports claim 1, applicants have once again presented that claim in modified form, calling for a thermal anneal chamber "disposed for access to" the loading station. The limitation as to the annealing chamber "adjacent" the loading station is once again an immaterial limitation and one shown by the file history as unnecessary in allowance of the claims.

The remaining claims, namely claims 74-77, have been copied verbatim from claims 2, 3, 4 and 5 of the '163 patent.

The support for the foregoing claims in the present specification is set forth in the following tables:

73. An electro-chemical deposition system, comprising:	Figure 1; p. 6, lines 2-4, "Fig. 1 shows various components of a processing station 10 suitable for electroplating a metal, such as copper, onto a semiconductor wafer in accordance with the disclosed method."; Figures 16 and 17; p. 27, lines 18-20, "One

	or more of the foregoing heating systems may be integrated with a wet-chemical processing tool that is capable of electrochemical deposition of copper."
a) a mainframe having a mainframe wafer transfer robot;	Figures 16 and 17; p. 28, lines 7-9, "The workpieces are transferred between the processing stations 610 and the annealing station 615 using one or more robotic arms 620 that are disposed for linear movement along a central track 625."; p. 28, lines 11-13, "Unlike the embodiment of Fig. 16, this embodiment employs a separate heating unit 635 that is serviced by a dedicated robotic mechanism 640."
b) a loading station disposed in connection with the mainframe;	Figures 16 and 17 (reference "I/O")
c) one or more processing cells disposed in connection with the mainframe;	Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more electroplating stations, although further wet-chemical processing stations may also be employed."
d) an electrolyte supply fluidly connected to the one or more processing cells;	Figure 1; p. 7, lines 10-12, "Process fluid is provided to the cup through fluid inlet line 65 and proceeds therefrom through fluid inlet openings 75. Plating fluid then fills the chamber 35 through openings 75 as supplied by a plating fluid pump (not shown) or other suitable supply."
e) a rinse-dry chamber (RD) disposed for access to the loading station; and	Figures 16 and 17; p. 28, lines 1-4, "The system of Fig. 16 includes a plurality of processing stations 610. Preferably, these processing stations include one or more rinsing/drying stations and one or more

	electroplating stations, although further wet-chemical processing stations may also be employed."
f) a thermal anneal chamber disposed for access to the loading station.	Figure 16; p. 28, lines 4 -9, "The system also preferably includes an annealing station, such as a at 615, for executing a low-temperature annealing process on each workpiece. The annealing process may be executed and a single-wafer or batch processing fashion. The workpieces are transferred between the processing stations 610 and the annealing station 615 using one or more robotic arms 620 that are disposed for linear movement along a central track 625."; Figure 17; p. 28, lines 10-14, "Fig. 17 illustrates a further manner in which an annealing station 630 may be integrated in a wet-chemical processing tool set. Unlike the embodiment of Fig. 16, this embodiment employs a separate heating unit 635 that is serviced by a dedicated robotic mechanism 640. The dedicated robotic mechanism 640 accepts workpieces that are transferred to it by the robotic mechanisms 620."

74. The system of claim 73 wherein the thermal anneal chamber comprises a rapid thermal anneal chamber having a heater plate.	Figure 11; p. 24, lines 18-20, "Figs. 11- 15 illustrate various manners of heating a surface of the workpiece 490 to create the desired temperature gradient. In Fig. 11, the workpiece 490 is disposed on a hot plate 530 to heat a first side of the workpiece."

75. The system of claim 74 wherein the heater plate comprises an atmospheric pressure heater plate.	Figure 11; p. 24, lines 18-22 and p. 25, lines 1-4, "Figs. 11- 15 illustrate various manners of heating a surface of the workpiece 490 to create the desired temperature gradient. In Fig. 11, the workpiece 490 is disposed on a hot plate 530 to heat a first side of the workpiece. Heat is removed from the opposite side of the workpiece 490 by directing a flow of a cooler gas, illustrated by arrows 535 across the workpiece. The temperature difference between the hot plate 530 and the cooler gas 535, as well as the flow rate of the gas, can be used to control the temperature gradient. Depending on the desired temperature gradient, a separate source of cooler gas may be unnecessary thereby allowing the use of ambient gas."

76. The system of claim 73, further comprising: e) a system controller adapted to control operations of one or more components of the electro-chemical deposition system.	Figure 15; page 25, lines 21-22 through page 26, lines 1-3, "A high-precision apparatus for generating the desired temperature gradient is illustrated in Fig. 15. In this embodiment, a laser 570 is connected for two-dimensional movement to a laser position drive mechanism 575. Control of the position of the laser 570 by the drive mechanism 575 is effected by a programmable control system 580.

77. The system of claim 76, wherein the thermal anneal chamber further comprises a gas inlet adapted to introduce one or more gases into the thermal anneal chamber.	Figure 11; p. 24, lines 18-22 and p. 25, lines 1-4, "Figs. 11- 15 illustrate various manners of heating a surface of the workpiece 490 to create the desired temperature gradient. In Fig. 11, the workpiece 490 is disposed on a hot plate 530 to heat a first side of the workpiece. Heat is removed from the opposite side of

	the workpiece 490 by directing a flow of a cooler gas, illustrated by arrows 535 across the workpiece. The temperature difference between the hot plate 530 and the cooler gas 535, as well as the flow rate of the gas, can be used to control the temperature gradient. Depending on the desired temperature gradient, a separate source of cooler gas may be unnecessary thereby allowing the use of ambient gas."

Applicants are, of course, mindful, that the Count in any interference declared by the above-identified application and the '163 patent must abide by the usual rule that multiple counts are not permitted unless they are patentably distinct each from the other. In this case, applicants believe that the count should correspond to the broadest claim. In this case, that is claim 12 of the '163 patent and claim 70 of the present application. Applicants therefore suggest that the count of this interference be established based on claim 12 of the '163 patent. All the remaining claims of both the present application as well as the '163 patent should be designated as corresponding to the count.

The Examiner is therefore respectfully requested to refer this application to the Board of Patent Appeals and Interference to declare an interference, naming applicants as the Senior Party.

Respectfully submitted,

By _____
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